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Hybrid magnetic carbon nanocomposites for environmental catalytic applications

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Meeting current quality requirements for wastewater reuse is a great challenge, in which materials science and catalysis hold great potential. Bearing this in mind, our work has been focused on developing highly active and stable hybrid magnetic carbon nanocomposites for environmental catalytic applications, such as catalytic wet peroxide oxidation (CWPO) and activated persulfate oxidation. A detailed catalyst design (Figure 1), based on the understanding of the surface reactions and interactions involved in the CWPO process,^{1,2} has allowed us to develop a high performance ferromagnetic graphitic nanocomposite (CoFe₂O₄/MGNC).³ CoFe₂O₄/MGNC was then employed in CWPO, activated persulfate oxidation⁴ and used to develop a new application – coined as magnetically activated catalytic wet peroxide oxidation (MA-CWPO).⁵ This communication reports the main findings obtained throughout these steps.

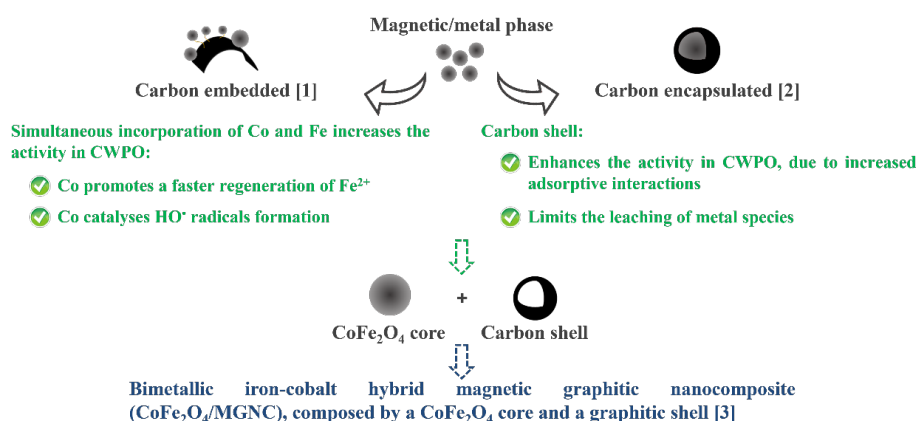


Figure 1. Steps taken to develop a high-performance catalyst for environmental applications.

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